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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,137	11/19/2003	Michiel van Nieuwstadt	81088290	7017

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EXAMINER	
TRAN, DIEM T	

ART UNIT	PAPER NUMBER
3748	

DATE MAILED: 08/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/716,137	NIEUWSTADT ET AL
	Examiner	Art Unit
	Diem Tran	3748

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) *27-33* is/are allowed.

6)☒ Claim(s) *1-5, 7-11, 13-26, 34-42* is/are rejected.

7)☐ Claim(s) *6 and 12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 10, 11 are objected to because of the following informalities:

The claimed limitations as stated in claim 10 and claim 11 are the same.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-5, 8-11, 13-22, 34, 35, 41, 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunt et al. (US Patent 5,426,934) in view of Jerger et al. (US Patent 6,112,518).

Regarding claims 1-3, 10, 11, 13-16, 34, 35, 41, 42, Hunt discloses a method for diagnosing degradation of a lean exhaust gas aftertreatment system, the system including a NOx catalyst (20) having a first NOx sensor (22) coupled upstream of the catalyst and a second NOx sensor (24) coupled downstream of the catalyst, the method comprising:

comparing a first NOx sensor measurement and a second NOx sensor measurement; and providing an indication of system degradation when a difference between said first NOx sensor measurement and said second sensor measurement is greater than a second predetermined value (see col. 6, lines 29+, col. 7, lines 1-3); however, fails to disclose comparing said first and second sensor measurement when the

catalyst is within a first predetermined temperature range. Jerger teaches that it is conventional in the art, to compare a first and second sensor measurement when the catalyst is within a first predetermined temperature range (see col. 2, lines 64-67, col. 3, lines 1-9, col. 5, lines 4-13).

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized the teaching of Jerger in the Hunt method, since the use thereof would have resulted in more accurate assessment determination of the catalyst working condition.

Regarding claims 4, 21, 22, Hunt further discloses estimating an amount of NOx in an exhaust gas mixture entering said catalyst device (see col. 7, lines 10-13).

Regarding claim 5, Hunt further discloses that the indication of system degradation comprises indicating a first NOx sensor degradation if a difference between said first NOx sensor reading and said estimate is greater than a third predetermined value (see col. 7, lines 10+); however, fails to disclose indicating a second NOx sensor degradation otherwise.

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to repeat the procedure used for the first NOx sensor to indicate a second NOx sensor degradation, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis paper Co. v. Bemis Co., 193 USPQ 8.*

Regarding claims 8, 9, 17, 18, the modified Hunt method discloses all the claimed limitations as discussed in claims 1,13 above, however, fails to disclose that said first predetermined temperature range is a temperature range below 150°C or above 450°C.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a specific optimum range of the temperature being below 150°C or above 450°C, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claims 19, 20, the modified Hunt method discloses all the claimed limitations as discussed in claim 13 above; Jerger further teaches that said catalyst temperature is determined based on a mid-bed catalyst temperature sensor (see col. 4, lines 30-32, 40-45); however, fails to disclose that said catalyst temperature is determined based on a temperature measurement downstream or upstream of said catalyst.

With regard to the limitation directed to the position of the temperature measurement, it is the examiners position that the such would have been an obvious matter of design choice well within the level of ordinary skill in the art depending on design variables such as the accessability of a location for a temperature sensor etc...Moreover, there is nothing in the record which establishes that the claimed position present a novel or unexpected result (see In re Kuhle, 526 F.2d 553, 188 USPQ 7(CCPA 1975)).

Regarding claim 35, the modified Hunt discloses the claimed invention except for a reductant injection system injecting a reductant into said lean exhaust gas aftertreatment device.

With regard to the preamble directed to a reductant injection system injecting reductant into the lean catalyst device, a preamble to a claim is denied the effect of a limitation where the claim is drawn to a structure and the portion of the claim following

the preamble is a self contained description of the structure not depending for completeness upon the introductory clause. See *Kropa v. Robie, supra at 480.* See also *Ex parte Mott, 190 USPQ 311, 313* (PTO Bd. Of App. 1975). Claim 35 clearly does not require the preamble for completeness.

Claims 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunt et al. (US Patent 5,426,934) in view of Jerger et al. (US Patent 6,112,518) as applied to claim 22 above, and further in view of Ishizuka et al. (US Patent 6,185,929).

Regarding claims 23-25, the modified Hunt method discloses all the claimed limitations as discussed in claim 22 above; however, fails to disclose estimating an amount of NOx in an exhaust gas mixture entering said catalyst device based on engine operating conditions such as an engine speed and engine load. Ishizuka teaches that it is conventional in the art, to estimate an amount of NOx in an exhaust gas mixture entering said catalyst device based on an engine speed and engine load (see col. 14, lines 12-15).

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized the teaching of Ishizuka in the modified Hunt method, since the use thereof would have been routinely performed by those with ordinary skill in the art.

Regarding claim 26, the modified Hunt method discloses all the claimed limitations as discussed in claim 25 above; Hunt further discloses providing an indication of said first NOx sensor degradation if a difference between said first NOx sensor measurement and said estimated amount NOx in said exhaust gas mixture entering said

catalyst is greater than a second predetermined value (see col. 7, lines 10+); however, fails to disclose indicating a second NOx sensor degradation otherwise.

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to repeat the procedure used for the first NOx sensor to indicate a second NOx sensor degradation, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis paper Co. v. Bemis Co., 193 USPQ 8.*

Claims 36-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itou et al. (US Patent 6,145,305) in view of Jerger et al. (US Patent 6,112,518).

Regarding claims 36-38, Itou discloses a diagnostic system, comprising: a lean burn internal combustion engine;

a NOx catalyst coupled downstream of said engine;

a NOx sensor (14) providing a measurement of an amount of NOx in an exhaust gas mixture exiting said catalyst (see Figure 1); and

a controller estimating an amount of NOx in an exhaust gas mixture entering said catalyst based on engine operating conditions, said controller comparing said estimate to said NOx sensor measurement and providing an indication of system degradation based on said comparison (see col. 1, lines 58-67, col. 2, lines 1-2); however, fails to disclose said comparing is performed when a catalyst temperature is within a predetermined temperature range. Jerger teaches that it is conventional in the art, to perform said comparing when a catalyst temperature is within a predetermined temperature range to

determine the degradation of the system (see col. 2, lines 64-67, col. 3, lines 1-9, col. 5, lines 4-13).

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized the teaching of Jerger in the Itou method, since the use thereof would have resulted in more accurate assessment determination of the catalyst working condition.

Regarding claims 39, 40, the modified Hunt method discloses all the claimed limitations as discussed in claim 36 above, however, fails to disclose that said predetermined operating temperature range is below 150°C or above 450°C.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a specific optimum range of the temperature being below 150°C or above 450°C, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Allowable Subject Matter

Claims 27-33 are allowed.

Claims 6, 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication from the examiner should be directed to Examiner Diem Tran whose telephone number is (703) 308-6073. The examiner can normally be reached on Monday -Friday from 8:00 a.m.- 5:30p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion, can be reached on (703) 308-2623. The fax number for this group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0861.

Diem Tran
Patent Examiner
Art unit 3748

DT
August 6, 2004

THOMAS DENION
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700